Product Review

HAL Communications DXP38 HF Modem

This review was part of a multi-unit review in the April 2000 issue of *QST*. The HAL Communications DXP38 was reviewed with three other units: the Kantronics KAM '98, the Timewave PK232DSP, and the SCS PTC-IIe. All references to 'group' in this article refer to these units. Reprinted with permission; copyright ARRL.

The HAL DXP38 does not offer as many modes as the other MCPs in this group, but it does extremely well with what it *does* offer: PACTOR, RTTY, ASCII, AMTOR and CLOVER II.

The DXP38 manual is the best of the group. It is well written, well organized and concise. The writing style is conversational with a slight touch of humor.

You hardly need the manual to install the DXP38. Unlike the other MCPs in this group, the DXP38 uses RCA phono jacks on the rear panel, which makes cabling a breeze. (If you've ever soldered several wires onto a DIN plug, you know what we mean.)

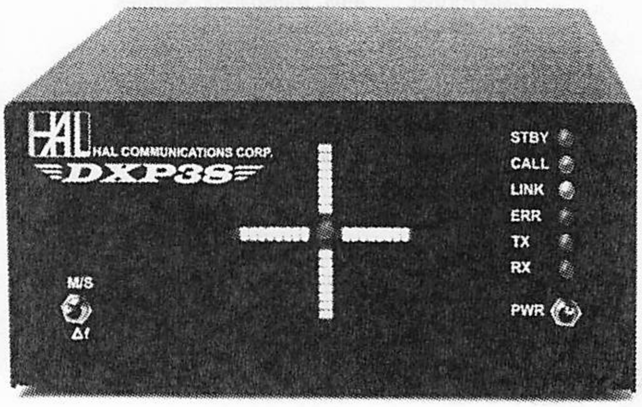
Once you're up and running, you have your choice of FSK for RTTY, AMTOR and PACTOR, or AFSK for the entire set. Clover II must be sent using AFSK, so we opted for AFSK for all of our testing. A trim pot to adjust the transmit audio level is accessible from the rear panel.

HAL Communications has a long history in HF digital communication. Its RTTY terminal units are still considered among the best in the world. It's no surprise, then, that the RTTY performance of the DXP38 was the best in the group. In weak-signal conditions and brutal contest environments, the DXP38 consistently copied RTTY when the other MCPs displayed mostly gibberish. The hardware tuning indicator—an LED emulation of the traditional "crossed bananas" oscilloscope display—was a joy to use. Even weak, interference-laden signals could be tuned quickly and accurately.

The DXP38's PACTOR performance (HAL refers to this as *P-Mode*) was also outstanding. We were able to establish and hold PACTOR links under marginal conditions. Only the SCS PTC-IIe could top the DXP38 in this category.

We ran into difficulty testing the DXP38 on AMTOR, but that had nothing to do with the device itself. AMTOR signals are as rare as proverbial hen's teeth these days and the only way we could conduct AMTOR tests with this or any of the other MCPs was to arrange skeds. Despite the hassles, the DXP38 seemed to acquit itself very well in this mode.

And then there is Clover II. This complicated 4-tone mode is the chief competitor to SCS's PACTOR II. Both modes have been doing battle for dominance in the commercial and amateur markets for years. Of course, both companies insist that their mode is superior and can present evidence to prove their cases. In our brief, informal tests… it was a draw. We did not notice substantial performance differences between PACTOR II and Clover II. Under identical conditions both modes appeared to transfer our sample files in roughly the same amounts of time. As with PACTOR II, the overall performance of Clover II was remarkable, maintaining links and transferring data in conditions under which we could just barely hear the other stations.



Clover requires high transceiver stability (+/- 5 Hz drift per hour, maximum) and slow, careful tuning for optimal results. The DXP38's tuning indicator was helpful, but it is only updated every 2 seconds in Clover II, so you have to tune very carefully. Once you find a Clover signal (it sounds like an extended *brrrrrrr*) and tune it in, the best thing to do is leave your radio alone. Even a slight VFO tweak is sufficient to break the link.

HAL Communications was the only company to provide both *DOS* and *Windows* software with their product. We used the *Windows* software and it worked extremely well. (Some preferred the *Windows* tuning indicator for Clover II rather than the hardware display.) Unlike the other burst modes, Clover II is bi-directional, which means that it is sending and receiving information at regular intervals without waiting for an "over" command from the operator. This made live QSOs a bit tricky because the one operator could begin commenting on something you said before you were even finished saying it!

Despite the excellence performance of Clover II, hams have not embraced this mode in large numbers. The fact that the Winlink 2000 e-mail network is almost exclusively based on PACTOR will not help this situation in the immediate future. Clover BBSs and live QSOs are not as scarce as G-TOR or AMTOR contacts, but they are not plentiful, either.

—Steve Ford, WB8IMY
Managing Editor, *QST*

DXP38

SPECIFICATIONS

CLOVER-II:

Data Format	8-bit, transparent, 4-tones
Tone Center	750/1250/1750/2250 Hz
Bandwidth	500 Hz @ -50 dB
Symbol Rate	31.25 per second
Error Correction Coding	Reed-Solomon; 60, 75, or 90%
ARQ Mode Modulation	BPSM, QPSM, 8PSM, 8P2A, 16P4A
ARQ Protocol	2-level, multiblock auto adaptive
Adaptive Mode Control	Set TX mode by measuring S/N and phase dispersion
ARQ Throughput	60-560 bits per second
FEC Mode Modulation	2DPSM, BPSM, QPSM, 8PSM, 8P2A, 16P4A
FEC Throughput	30-360 bits per second

HARDWARE:

Cabinet	Aluminum, black 3.5" x 7.5" x 10.75"
DSP Processor	TI TMS320C25-50
Control Processor	Motorola 68EC000
Analog I/O	TI TLC320AC01 14-bit Codec
Memory	Flash RAM
I/O Interface	Serial RS232, 9.6 to 57.6 kbps
Power Input	9 to 18 VDC, .6 amp
Mode Indicators	STBY, CALL, LINK, ERROR, TX, RX
Tuning Indicator	"+" of 4 10-segment LED-bars
M/S Modes	FSK: Mark and Space Filter Amplitudes CLOVER: Tone 1, 2, 3, 4 Filter Amplitudes
Δf Mode	All modes zero-center frequency error, +/- 50 Hz range
Radio Connections	RX Audio, TX Audio, PTT, FSK, SEL-CAL

FSK WAVEFORM:

FSK Tones	500-3000 Hz, programmable
TTY Code	Baudot and ASCII
TTY Rates	45, 50, 57, 75, 100, 110 Baud
TOR Code	CCIR-476 and CCIR-625
TOR Modes	ARQ, FEC, SEL-FEC
TOR Rate	100 Baud
P-Mode* Modes	Auto-ARQ and FEC
P-Mode* Rates	100/200 Baud

SOFTWARE:

Firmware	On-board stored in Flash RAM (upgraded via serial I/O)
Terminal Software	Included with DXP38: Proven terminal software for PC-DOS New DXPWin terminal software for Windows (95, 98, NT)
Updates	Free updates to HAL software via www.halcomm.com
Third Party	Works with existing 3rd party software (same commands as DSP4100)

WARRANTY:

One year parts and labor

Specifications subject to change without notice. A copy of the warranty may be obtained, free of charge, upon request.

The term "P-Mode" is the HAL designation for a communications protocol that may also be known as "Pactor," a registered trademark of the Spezielle Communications Systeme GmbH (SCS) firm in Hanau, Germany. HAL affirms that, to the best of its knowledge, "P-Mode" is compatible and interoperatable with the protocol SCS calls "Pactor" and with the link establishment and weak signal modes of the protocol SCS calls "Pactor II."

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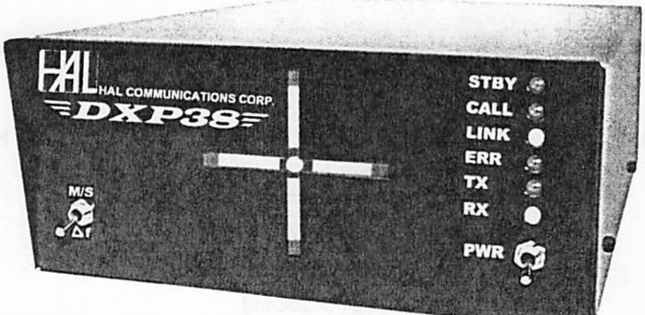
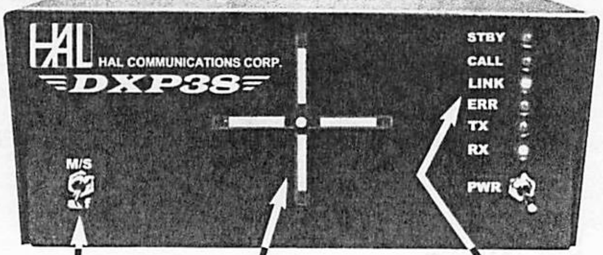
By Popular Request:

$395



DXP38
DSP HF Radio Modem


HAL
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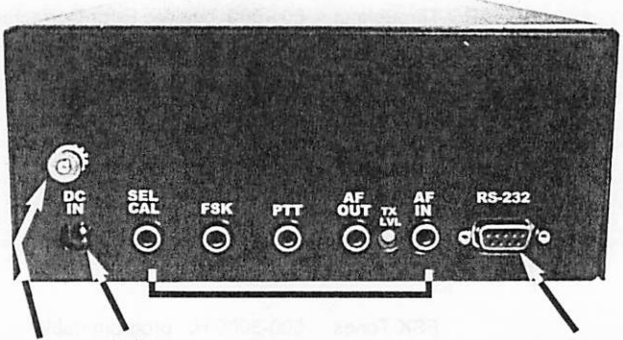
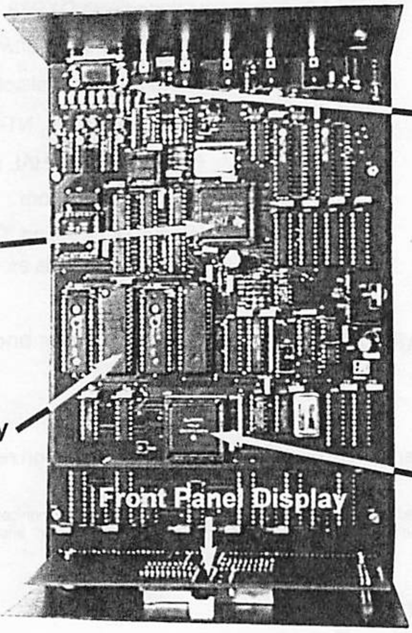
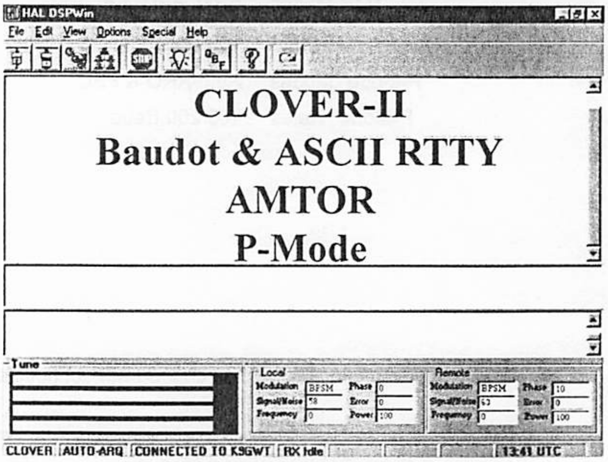
DXP38
M/S
STBY
CALL
LINK
ERR
TX
RX
PWR
M/S or Δf for FSK and CLOVER
RTTY-1 Style Tuning Indicator
Status Indicators for all Modes







CLOVER-II
Baudot & ASCII RTTY
AMTOR
P-Mode

Local: Modulation BPSM, Signal/Noise 58, Frequency 0, Phase 0, Error 0, Power 100
Remote: Modulation BPSM, Signal/Noise 63, Frequency 0, Phase 10, Error 0, Power 100

CLOVER | AUTO-ARQ | CONNECTED TO K9GWT | RX Idle | 13:41 UTC

Windows 95/98 NT 4.0
Terminal Software

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